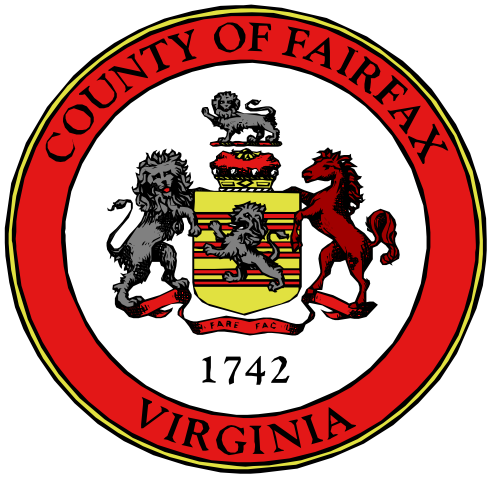
INTERNAL AUDIT REPORT

IT INVESTMENT MANAGEMENT AUDIT



Fairfax County Internal Audit Office

FAIRFAX COUNTY, VIRGINIA
INTERNAL AUDIT OFFICE
M E M O R A N D U M

TO: Robert J. O'Neill, Jr.
County Executive

DATE: March 23, 1999

FROM: Ronald A. Coen, Director
Internal Audit Office

SUBJECT: Report on the ***"IT Investment Management Audit"***

This is a report on the ***"IT Investment Management Audit".*** It was performed as part of our FY1999 Annual Audit Plan.

The findings and recommendations of this audit were discussed with Department of Information Technology. We have reached agreement on all of the recommendations and I will follow up periodically until implementation is complete. Their responses are incorporated into the report and their full responses are attached.

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TABLE OF CONTENTS

PAGE

Introduction

Investments in information technology (IT) can have a substantial impact on an organization's performance. A well-managed investment process can assist in providing high quality IT services to agencies and their customers. A weakened or poor investment process results in a lack of management information and the inability to make informed decisions about the organization's technology assets.

In large organizations, systems development services for new systems, system upgrades, and the implementation of new technology involve projects with significant risk. The kinds of risks generally associated with IT investments are cost and schedule overruns, unsatisfied user needs, and improper scope. These risks are a matter of degree that may lead to ineffective use of resources.

In the past three fiscal years, Fairfax County has spent over $120 million for information technology. A centrally controlled IT Project Fund, Subfund 150 (renamed Fund 104 for FY 99), is used to allocate money to the County's strategic, large scale system investments. Fund 104 was budgeted for $15.7, $17.7, and $24 million in FY 96, 97, and 98. Within Fund 104 are many large scale, multi-year projects. Examples of on-going projects include Land Development Systems (LDS), Tax Administration Information Systems, and Human Services Redesign. The County's FY 1999 Information Technology Plan contains more than $20 million for strategic IT projects. These projects include acquisition of computer hardware, software, consulting services, and application system development.

The County's strategic direction for IT emphasizes that management and implementation of IT will be a partnership between DIT, the agencies and external contractors. It also emphasizes that the County will manage information technology as an investment. The IT investment process is shared by the Department of Information Technology (DIT), Department of Management and Budget (DMB), and the IT sponsoring agencies. Oversight is also provided by a Board of Supervisors appointed Information Technology Policy Advisory Committee which began in 1997.

The standards applied for this audit divide the **IT investment management process** into three phases: selection, monitoring, and post evaluation. **(see Appendix Figure 1).** The overall objective is to ensure a disciplined management forum to make IT investment decisions. The **selection** phase consists of the steps to evaluate the risks, benefits, and costs of proposed IT projects and selects the best alternatives for the organization. The **monitoring** phase is the process of continuously evaluating the progress of IT projects for cost, schedule, quality, and deliverables. The **post evaluation** phase is an after the fact evaluation of a project's level of success and system user satisfaction that returns constructive feedback and potential improvements to the process.

Purpose and Scope

The audit of IT investment management was part of our long range audit plan. We conducted this audit to evaluate County efforts to manage project **selection, monitoring, and post implementation evaluation of IT investments**. We researched industry standards and guidelines that address these areas. Our audit followed guidelines from 1) U.S. GAO Guide - Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-making, 2) Commonwealth of Virginia – Council on Information Management: Mission Focused Information Management, 3) Federal OMB Guide: Evaluating Information Technology Investments and, 4) Software Engineering Institute – Software Acquisition Risk Management Handbook. We reviewed the County guidelines in place, support provided to project managers, evidence and documentation to determine if investment processes were current, comprehensive, and relevant to the County's business objectives.

We compared the County's FY 1999 processes in IT investment to the industry standards identified. During the course of the audit, we discussed and reviewed various proposed enhancements that management is intending to implement to the County's methods in the three phases of IT Investment. We focused on guidelines from GAO, the Commonwealth of Virginia, and Federal OMB. We reviewed the Software Engineering Institute standards, but due to the County's initial level of development, we did not proceed with a direct comparison.

We interviewed managers in DIT, DMB, and IT sponsoring agencies involved with current IT projects. Discussions and audit steps focused on County policy and procedures, practices in project management, and methods to improve the process. We did not analyze individual projects in detail to gauge their level of success.

Executive Summary

The Fairfax County Government IT investment process is currently being updated **(see Appendix Figure 2).** To date the County's implementation of systems has depended on specific individuals' knowledge, skills, and abilities rather than a formal set of management requirements.

In practice, **IT investment management** has been a mixture of methods from vendor procedures, informal or outdated County guidelines, and individual project manager approaches to this important area. The **selection phase** has achieved the most complete formal definition of IT investment processes thus far and improvements will be implemented for FY2000. **Project monitoring** is partially complete as it occurs at the project committee level and through the CIO's attendance to all major project meetings. Also, the Information Technology Policy Advisory Committee is given periodic briefings on project progress. Currently, there is not a formal roll-up of project status information being reported to a County senior management team **(see Appendix Figure 3).** However, the CIO has advised that a senior management IT policy committee will begin in January 1999. Project **post implementation reviews** have not been formally conducted. A few exceptions have been performed sporadically over the years with no formal management initiative to collect and benefit from project lessons learned.

Management has recognized this and is currently taking actions to improve and update the IT investment processes. These proactive steps include IT project management training, policy updates, and procedure improvements. DIT has begun initial stages of development of a new system development project methodology that can be applied to any platform. Internal Audit, over the course of the engagement, has reviewed preliminary draft documents of management's intended enhancements and these were taken into consideration in our conclusions. Therefore, the majority of our recommendations are in support of forward looking procedures and newly designed processes for IT planning, project monitoring, and post implementation reviews.

All IT projects, proposed, in development, or in production, should have complete project information available to senior decision-makers. Other organizations, including the private sector, Federal Government, and the Commonwealth of Virginia, have established methodologies for addressing the IT investment management processes. This includes published policies and guidelines as well as training. These practices are directed at providing a baseline of information upon which to make decisions and to develop expertise prior to an IT project.

Recommendations to improve and develop guidelines, and implement IT business practices are addressed to the Department of Information Technology. IT policy statements and supporting guidelines must be updated/replaced to implement a more comprehensive and complimentary set of IT business processes **(see Appendix Figure 4).** They should apply, at a minimum, to all Fund 104 projects.

Comments and Recommendations

DIT can take steps with DMB and the IT sponsoring agencies to implement policies and guidelines for IT investment management and assist staff assigned to these important technology initiatives. This can help to reduce risks associated with projects such as improper scope, cost and time overruns, and unsatisfied user needs. The County does have guidelines that deal with IT investment management. However, a portion is outdated, does not address modern development projects, and is not directed to the County as a whole. DIT has issued a **Policy Memo #10**, dated December 11, 1997, which establishes many positive policy directives for IT investment. This policy document, when supported by sufficient guidelines, can address the majority of unfinished areas as illustrated in **Figure 2**. Our recommendations focus on key implementation points for each of the three investment phases.

1. Project Selection has achieved the most complete formal definition of IT investment processes and management has developed improvements for FY2000.

We reviewed project submission processes for FY 1999. We found that some elements of the FY 1999 process were in need of improvements. Documentation of the ranking of proposed projects leading up to the budgetary and senior management reviews was not present. Staffing resources were not a required component of project submissions. DIT management has reviewed and made improvements to the selection process for the FY2000 budget. Internal Audit agrees with the changes being made to enhance communication and project submission for funding decisions.

Leading organizations assess all IT projects, proposed, in development, and operational. They prioritize and rank based on cost, risk, return, and mission needs. All necessary decision making information has been identified. They determine that each project has met project submission requirements. The effect of the current improvements is to establish a stronger business link between project submissions and the final product.

Management Improvements to the Selection Process

The following improvements are being implemented by DIT management for the FY2000 selection process:

- Further definition of the criteria for investment selection. Documentation of the ranking of proposed projects leading up to the budgetary and senior management reviews.

- Defining validation steps and questions to be completed in review of IT project proposed return on investment, benefits, and project alternatives.

- Requiring complete staffing resource information in project submissions so that ranking criteria will include actual staff resource availability in project selection decisions.

Response

Not required for Item #1.

2. There has been no formal reporting of project status information to a County senior management team.

Monitoring occurs at a number of different management levels. Monitoring is carried out by the CIO through his participation on individual project steering committees. Monitoring has been a mixture of methods by each project team. Financial monitoring for Fund 104 is formal, documented, and thorough. IT oversight is also provided through the Board of Supervisors' Information Technology Policy Advisory Committee. In past years, the County used senior management IT committees with duties divided among a Strategic Management Steering Committee, Corporate Data Systems, Computer Security, and Infrastructure Committee. DIT **Policy Memo #10**, which establishes many positive policy directives for IT investment, does not provide guidance on monitoring workflow, project activity tracking and reporting, reporting to senior management, and project documentation and retention. DIT has recently drafted a project management plan guideline that details project organization, responsibilities, milestones, schedules, and cost estimates. This guideline is a very good beginning. The document has been distributed for review and will be implemented as a requirement for all Fund 104 projects. Also, DIT has begun the process of developing a system development methodology that will include a section on project monitoring.

Leading organizations monitor IT projects throughout their life cycle to continually assess whether the investments are providing expected benefits. They document project actions and decisions, take measures of interim results, and aggregate data for review of collective actions. This is normally implemented through a management committee where senior executives review the entire project portfolio. This brings to the table a broad perspective through senior executives that can independently and objectively evaluate and make decisions on the overall status, mission needs, and priorities for the organization. If a project is not on schedule, is over budget, or not meeting performance expectations, senior executives decide whether it should be continued, modified, or cancelled. In the County, project monitoring is carried out by individual project groups and the CIO. Sharing information on a formal basis with the County's senior management team will begin in January 1999.

Recommendations

- Formalize a roll-up of project status information to the County's senior management team, which provides both financial and project activities together for review. This will enable senior management to identify risks, review problems, and respond to changing circumstances.

Agency Response

A Senior Management IT Policy Committee has been formed. The committee will meet quarterly and review on-going project status as well as review County strategic business initiatives so that IT projects can be aligned with them. Project status information requirements will be developed by the committee and provided per that guidance.

- Define what information must be reported to Project Steering Committees, DIT Policy, Planning and Administration, the CIO, and the County's senior management team. Specify the minimum reporting periods to be submitted based on project scope, size, and duration.

  Agency Response
  A project Steering Committee Charter will be developed which will outline their duties, responsibilities and detailed reporting requirements, to include minimum reporting periods based on project scope size and duration.

- Enhance and supplement DIT Policy Memo #10 by detailing sections for project steering committee responsibilities, project reporting, and project task plans. Specifically include language in the project steering committee section to require, at a minimum, meeting agendas, issue resolution procedures, and meeting summaries.

  Agency Response
  A Project Steering Committee Charter is deemed more appropriate than including such detail in Policy Memo #10. Beginning in FY2000, a formal Project Management Plan will be required for all projects.

- Require that projects maintain an approved baseline project schedule and major revised versions. Develop a standard for DIT to retain selected project records for a minimum of three years after completion of the project. Identify appropriate minimum records to be retained. For example, records to be retained might include: the Project Post Implementation Report, vendor contract and amendments, original project plan and amendments, budget, staffing, test plans, and other project deliverables.

  Agency Response
  Included in the Project Management Plan is the requirement to develop a project baseline with formal documentation of all revisions plus a communication requirement for regular progress reports and other forms of communications on project issues. Project revisions will be provided to Project Steering Committees and rolled up to the Senior Management IT Policy Committee. DIT will establish a retention standard for project files.

3. Project Post Implementation reviews have not been formally conducted.

With few exceptions, there has been no management directive to collect and benefit from project lessons learned. DIT has begun the process of developing a project methodology that will include a section on post-implementation reviews.

Leading organizations evaluate actual versus expected results for IT projects and revise their management process based on lessons learned. They use standard methodologies, document the project track record, and take measurements of actual vs. projected performance. The effect of current practices is that beneficial experience is not distributed to project teams and managers who may also benefit. Continuous improvement of IT business practices is not achieved.

Recommendations

- As part of revising DIT project management standards, re-establish a post implementation requirement.

  ### Agency Response
  A Project Completion and "Lesson Learned Report" is currently a requirement promulgated through DIT Memo No 10. Project managers are required to send a report to the CIO identifying accomplishments, cost information, and "Lesson Learned".

- Design a post implementation evaluation guideline for use by those performing these evaluations. Focus on lessons learned, comparison of projected vs. actual project benefits, achievement of project goals and functions, a comparison of actual and estimated costs, and potential recommendations for improving IT project practices.

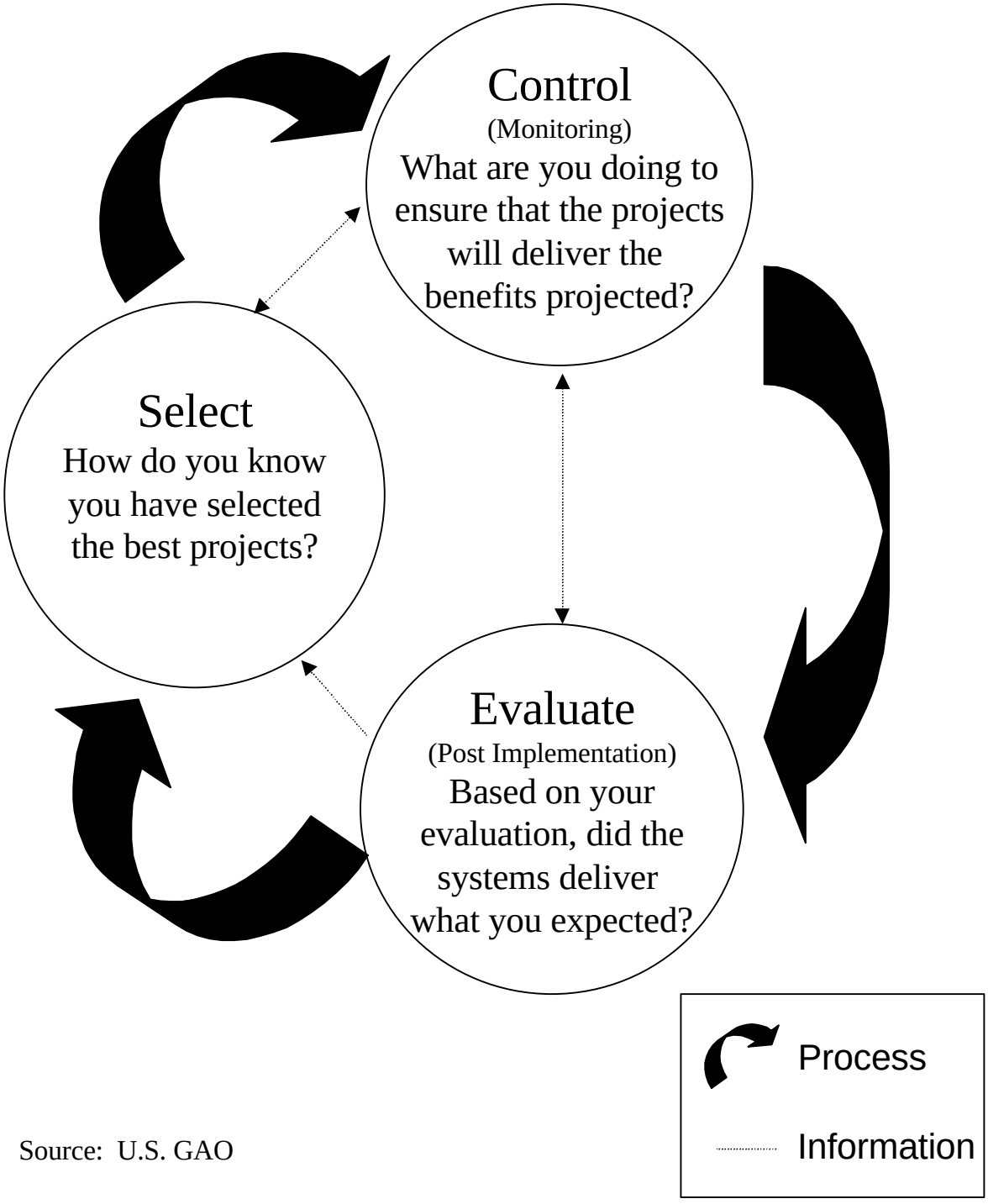
  ### Agency Response
  Project Lessons Learned Reports will be made a part of the Project Management Training and Certification Program. The information requirements for the report are incorporated in the Project Management Plan.

- Establish a formal and broad distribution of the resulting project report "lessons learned" to the senior management team, the CIO, and agency and DIT project managers.

  ### Agency Response
  Project Lessons Learned Reports will receive wide distribution to include the Senior Management IT Policy Committee, the IT Policy Advisory Committee, and Project Managers. Additionally, we are currently exploring the feasibility of using the County's Intranet too as a means of disseminating this information to a larger audience. The concept is to design an interactive on-line Template that project managers can input into and then be summarized for general distribution.

Figure 1

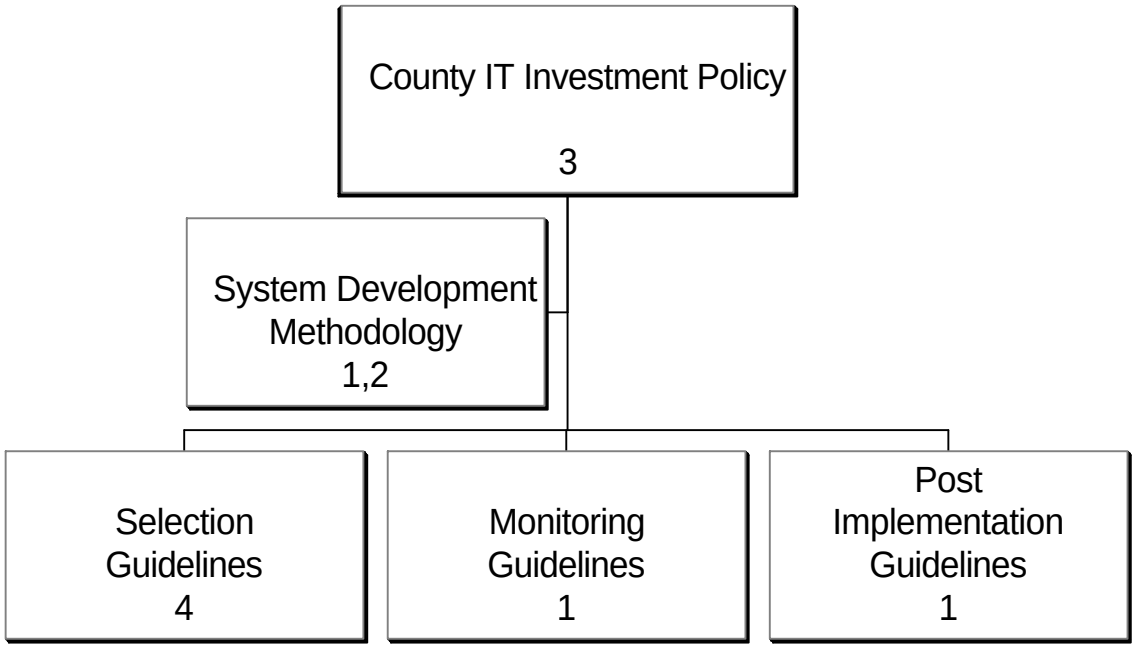
An IT Investment Approach Used in Leading Organizations



Source: U.S. GAO

Figure 2

Status of Policy and Guideline Framework for IT Investment



Status

1 = outdated ORS standards - 1987 (to be updated)
2 = now in draft stage
3 = partially developed
4 = majority complete with updates for FY2000

Figure 3

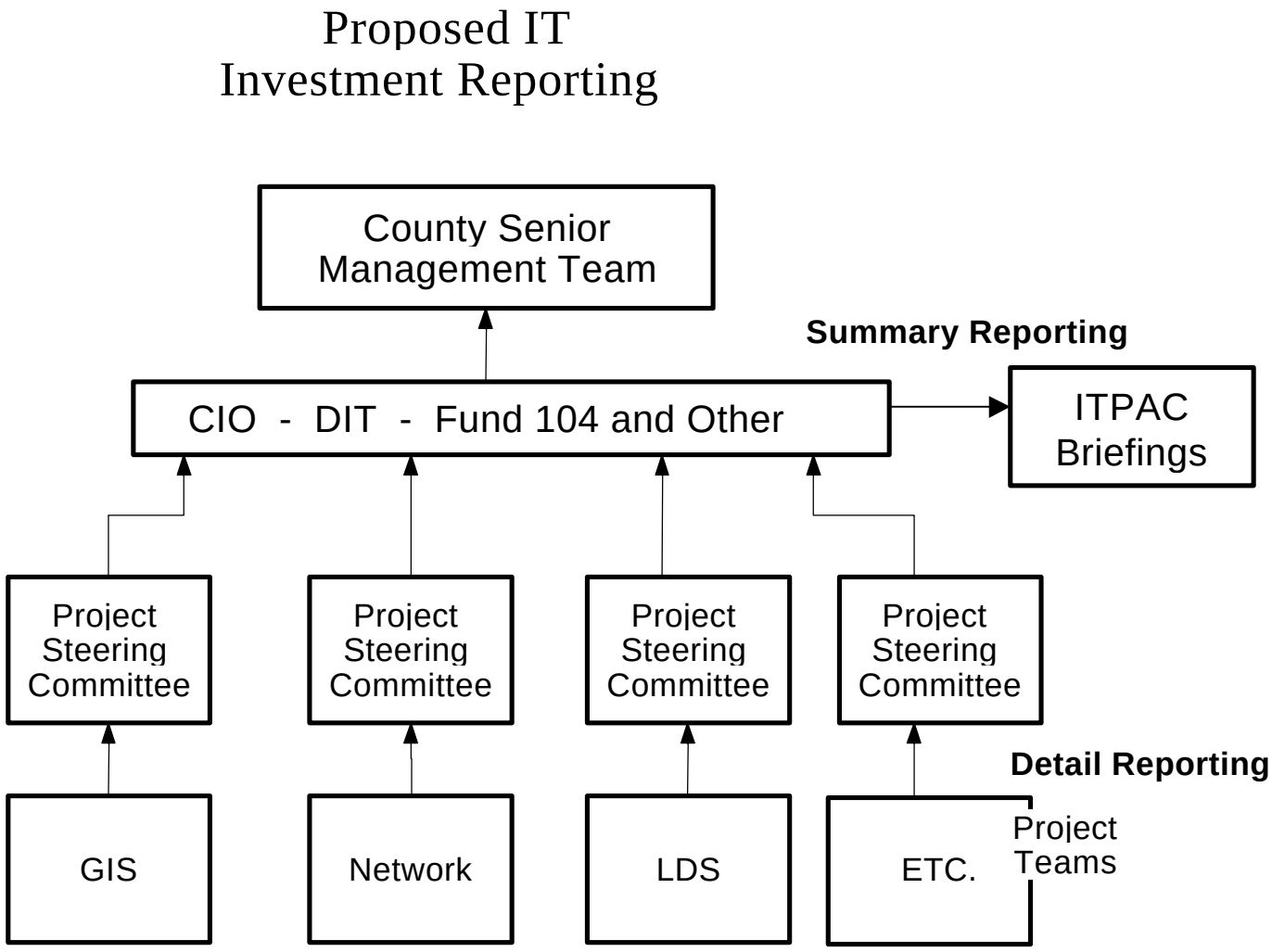

Proposed IT
Investment Reporting
County Senior
Management Team
Summary Reporting
CIO - DIT - Fund 104 and Other
ITPAC
Briefings
Project
Steering
Committee
Project
Steering
Committee
Project
Steering
Committee
Project
Steering
Committee
Detail Reporting
GIS
Network
LDS
ETC.
Project
Teams

Figure 4

It Investments Audit
Suggested Guidelines Content Outline

	Selection Phase Guidelines
Well-Defined Process	• Overview of Process • Roles and Responsibilities • Selection Workflow • Calendar/Time Table for IT Planning • Project Request Guidelines • Submission Format • Project Alternatives • Project Business Objectives • Project Feasibility • Quality Assurance/Validation Procedures • Project Cost Schedule • Project Benefits • Return on Investment • Ranking Criteria and Deliverables
	Monitoring Phase Guidelines
Additional Work Needed	• Overview of Project Oversight • Roles and Responsibilities • Monitoring Workflow • Project Activity Tracking and Reporting • Financial Tracking and Reporting • Reporting to Senior Management • Project Documentation and Retention
	Post Implementation Phase Guidelines
Additional Work Needed	• Overview of Project Post Implementation Reviews • Roles and Responsibilities • Formal Allocation of Staff • Reviewer Independence • Post Implementation Workflow • Standard Evaluation Workplan • Timing and Frequency of Review • Reporting Results to IT Policy Committee, CIO, and Project Teams